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## Taxonomic Study on *Leucania striata* LEECH and its Close Relatives, with a Description of a New Species (Lepidoptera, Noctuidae)

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**Abstract** A lectotype is designated for *L. striata* LEECH, a pest of sorghum and maize, and one new species, *L. substriata*, is described. Descriptions of male and female genitalia are given to another related species, *L. insecuta* WALKER.

### Introduction

*Leucania striata* LEECH is a common noctuid moth in the south west of Japan, and its larva has been known as a pest of sorghum and maize (NAITO, 1980). This moth has been distinguished by its characteristic wing pattern from other species of this genus. In recent years, however, through the examination of many specimens from various localities, I found that '*L. striata*' included two species, which are superficially closely similar to each other and are distinguished only by differences in male and female genitalia. The distributions of them are also different.

*L. striata* was originally described by LEECH (1900) from Japan, without type designation. LEECH indicated in his original description of the species that there were 16 specimens including both sexes in PRYER's collection, and that they were collected from the Yokohama district in Honshu and the Roochoo Islands. Later HAMPSON (1905) synonymized *L. striata* with *L. insecuta*. And this treatment had been followed until SUGI (1962). He treated them as distinct species based on superficial characters as well as male and female genitalia. According to Dr. J. D. HOLLOWAY of British Museum, seven specimens of *striata* are preserved in the collection of British Museum, two of which, one male and one female, are labelled as types. They are all labelled "Japan", but bearing no precise data. Having examined the figures of genitalia based on the present materials, Dr. HOLLOWAY has confirmed that the one of the two forms from Japan well matched in its genital features with the types.

In the present paper, a lectotype is designated for *L. striata* and its closely related species is described as new. In addition, another close relative, *L. insecuta* is described in male and female genitalia.

The terminology of male genitalia follows mainly SHIBATANI *et al.* (1954) and SHIRÔZU (1960) and those of female genitalia mainly KUZNETSOV (1967). Most of the hairs on the peniculus (bulged ventral margin of tegumen) are removed in the figures.

*Leucania substriata* sp. nov.

(Figs. 1, 2, 3A – G)

Expanse 36 – 46 mm.

Head, thorax and abdomen ochreous; frons and vertex with dark bars; tegula with three dark lines, the central being the darkest, and with greyish tips. Forewing ochreous; interspaces of the veins streaked with brown; antemedial line usually represented by three black points, on costa, bellow cell, and on vein 1A+2A; claviform stigma represented by a black point; reniform stigma represented by a small white spot at lower angle of cell; median vein defined above and below with fuscous shade from base to beyond cell; postmedial line usually represented by a double series of black points, the inner ones being in the interspaces of veins, the outer on veins; a triangular shade from termen below apex; a terminal series of small black points; cilia fuscous. Underside of forewing ochreous, usually with a series of blakish spots on veins postmedially, the spot on costa being the largest; terminal area with a series of black spots on interspaces. Hindwing ochreous white; the veins fuscous; terminal area irrorated with fuscous; cilia white. Underside of hindwing ochreous white, usually with fuscous dots on veins postmedially; terminal area and upper area beyond vein 7 ochreous; terminal area with a series of small black spots on interspaces.

Male external genital structure: Tegumen wide in lateral view. Fenestrula wide and membranous. Anellus with a wide and weakly sclerotized area dorsolaterally; subligula long. Vinculum long and curved posteriorly on dorsal portion. Saccus small. Uncus long and strongly curved on distal 3/5, with many short hairs on distal half. Valva long; transtilla elongated anteriorly; posterior part of costa bulged dorsally; editum small; ampulla long and strongly curved ventrally; sacculus slender and with short hairs anterodorsally; dorsal process of harpe slender, posterodistal corner of harpe projected ventrally; valvula with long marginal spines; cucullus with marginal spines and bulged ventrally at distal 2/5. Juxta almost triangular in shape. Vesica 10.6 mm–12.9 mm when it is everted; vesica 3.7 times as long as aedeagus, bearing dense spinules on entire surface of distal 2/3, irregular rows of spines on distal half, and a large spine at distal end.

Female genitalia: Ductus bursae short, sclerotized and curved dorsally at the proximal part of antrum. Bursa copulatrix round, membranous and without signa. Cervix bursae coiled, base of cervix bursae broad and sclerotized in dorsal view. Papilla analis short.

Holotype: ♂, Kurinodake-onsen, Mts. Kirishima, Kagoshima Pref., 20 – 21. vii. 1983 (N. KÔDA, K. KONISHI & S. YOSHIMATSU).

Type depository: Laboratory of Insect Systematics, National Institute of Agro-Environmental Sciences.

Paratypes: [HONSHU] 1♂, Ryonan-danchi near Mozu, Ôsaka Pref., 27. vii. 1977 (M. GOTO). [SHIKOKU] 1♂, Kuma-chô, Kamiukena-gun, Ehime Pref., 3. viii. 1979 (Y. NAKATA); 1♂, Kôchi City, Kôchi Pref., 13. ix. 1972 (Y. SUZUKI). [KYUSHU]

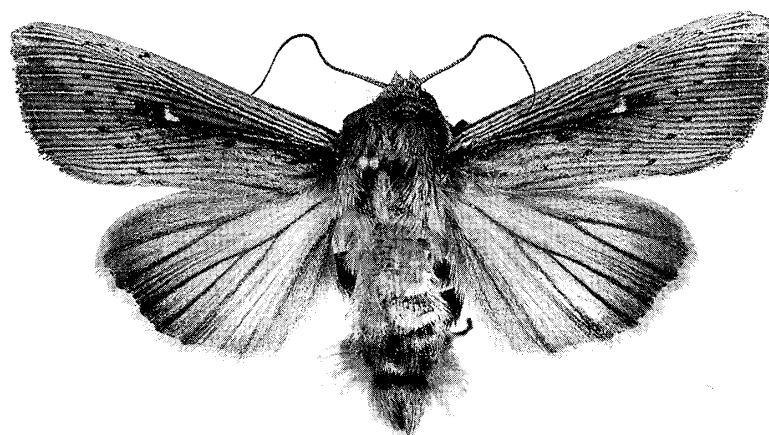


Fig. 1. *L. substriata* sp. nov., holotype.

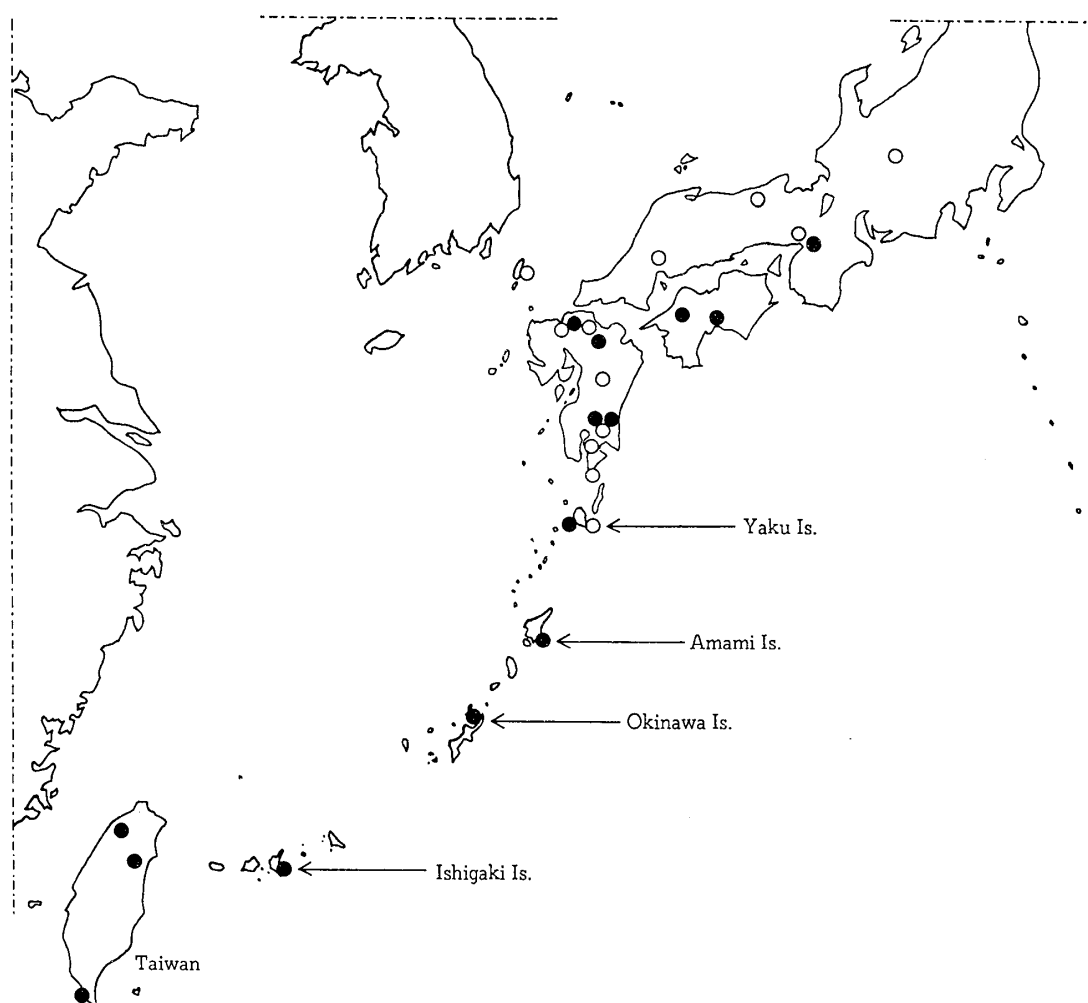


Fig. 2. Locality of *L. substriata*, sp. nov. and *L. striata* LEECH ; hollow circle shows *L. striata* LEECH, solid circle *L. substriata* sp. nov.

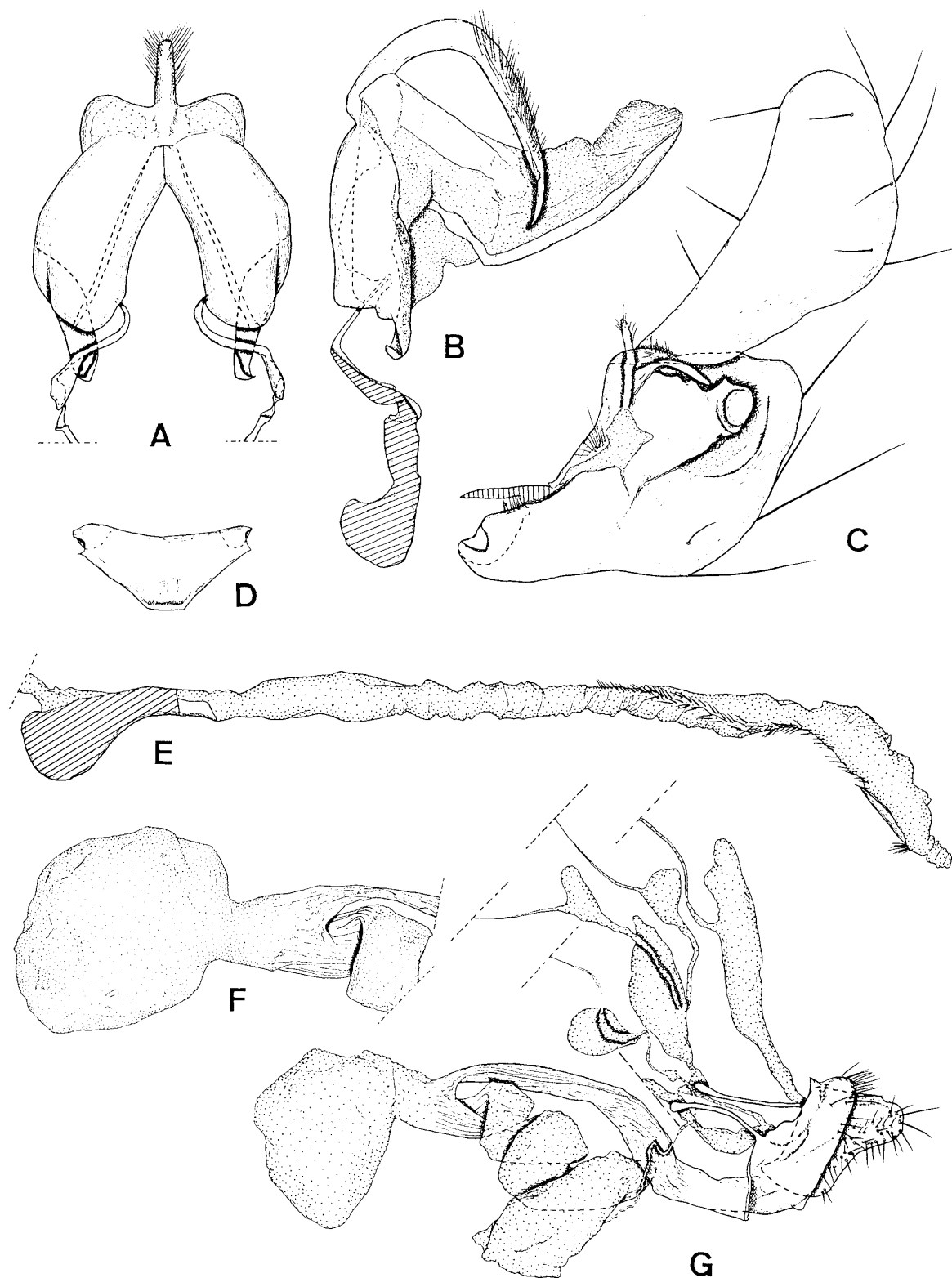


Fig. 3. Male and female genitalia of *L. substriata*, sp. nov. A. Ring, frontal view ; B. *Ditto*, lateral view ; C. Right valva, inner view ; D. Juxta, dorsal view ; E. Phallus, with vesica everted, lateral view ; F. Bursa, dorsal view ; G. Female genitalia, lateral view.

1♀, Mt. Inunaki, Hisayama-chô, Kasuya-gun, Fukuoka Pref., 28. vii. 1975 (K. UEDA, Y. YOSHIYASU & K. ÔHARA); 1♂, Hita City, Ôita Pref., 4. xi. 1978 (S. YOSHIMATSU & Y. YOSHIDA); 2♂, Miiike, Takaharu-machi, Miyazaki Pref., 16. v. 1983 (S. YOSHIMATSU & I. KANAZAWA et al.); 6♂, same locality and data as holotype (N. KÔDA, K. KONISHI & S. YOSHIMATSU); 4♂, Miyanoura, Yaku Is., Kagoshima Pref., 16. vii. 1971 (collector unknown); 1♂, Yaku Is., Kagoshima Pref., 21. vii. 1972 (collector unknown); 2♂, Anbou-rindou, Yaku Is., Kagoshima Pref., 22. vii. 1982 (S. YOSHIMATSU); 1♂, Koshima, Yaku Is., Kagoshima Pref., 23. vii. 1982 (K. KONISHI & S. YOSHIMATSU); 2♂, Shiratani-unsuikyô, Kagoshima Pref., 25. vii. 1982 (K. KONISHI & S. YOSHIMATSU); 2♀, same locality, 26. vii. 1982 (K. KONISHI & S. YOSHIMATSU); 1♂, same locality, 15. v. 1983 (I. KANAZAWA & K. KONISHI); 3♂, Yuwan, Amami Is., Kagoshima Pref., 26. vi. 1974 (K. UEDA, Y. SUZUKI & K. SETOYA); 1♂1♀, Mt. Yuwandake, Amami Is., Kagoshima Pref., 11. v. 1983 (S. YOSHIMATSU & S. NOMURA); 4♂, same locality, 12. v. 1983 (S. YOSHIMATSU & S. NOMURA); 7♂, Mt. Yuidake, Amami Is., Kagoshima Pref., 14. v. 1983 (S. YOSHIMATSU & S. NOMURA); 1♂, same locality, 29. viii. 1983 (R. NODA & K. HIRANO); 2♂, same locality, 31. viii. 1983 (R. NODA & K. HIRANO); 1♂, same locality, 3. ix. 1983 (R. NODA & K. HIRANO); 1♂, same locality, 4. ix. 1983 (R. NODA & K. HIRANO). [RYUKYU] 1♂, Yona, Okinawa Is., Okinawa Pref., 5. iv. 1979 (N. KÔDA et al.); 1♀, same locality, 7. iv. 1979 (N. KÔDA et al.); 1♂, same locality, 8. iv. 1979 (N. KÔDA et al.); 1♂, Okinawa Is., 29. vi. 1982 (N. KÔDA); 1♂, Mt. Terukubi, Kunigami-son, Okinawa Is., Okinawa Pref., 13. iii. 1985 (I. SAGARA); 1♂, Ishigaki Is., Okinawa Pref., 22. x. 1981 (S. YOSHIMATSU). [TAIWAN] 1♂, Mt. Shihtou-shan, Miaoli Hsien, 10. vi. 1975 (K. UEDA & K. SETOYA); 2♂, same locality, 11. vi. 1975 (K. UEDA & K. SETOYA); 1♀, same locality, 9–10. viii. 1983 (I. KANAZAWA); 1♂, same locality, 8. v. 1984 (S. YOSHIMATSU); 1♂, same locality, 10. v. 1984 (S. YOSHIMATSU); 1♀, Lushanwenchuan, Nantou Hsien, 11. v. 1984 (S. YOSHIMATSU); 1♀, Kenting, Pintung Hsien, 23. v. 1984 (S. YOSHIMATSU).

*Remarks.* This new species has the largest harpe among the three species dealt with here. The cervix bursae are coiled in this species and *striata*, but in *insecuta* it is nearly straight. The cervix bursae of this species is projecting from the left lateral part of ductus bursae, while, that of *striata* is projecting from the left dorsolateral part of the ductus bursae.

### *Leucania striata* LEECH

(Figs. 2, 4A-G)

*Leucania striata* LEECH, 1900, *Trans. ent. Soc. Lond.*, 1900: 127.

Male external genital structure: Tegumen wide in lateral view. Fenestrula wide and membranous. Anellus with a wide weakly sclerotized area dorsolaterally. Subligula long. Vinculum short and weakly curved dorsally. Saccus small. Uncus long and curved on distal 3/5, with many short hairs on distal 2/5. Valva long; transtilla elongated anteriorly; costa almost flat; editum moderate in size; ampulla long and

strongly curved ventrally; sacculus slender and with short hairs anterodorsally; dorsal process of harpe slender, posterodistal corner of harpe projected ventrally and reached to posterior  $1/2$  of valvula; valvula with long marginal spines; cucullus bulged ventrally at distal  $2/5$ , with marginal spines. Juxta almost V-shaped. Vesica 17.1 mm – 18.0 mm when it is everted and 5.1 times as long as aedeagus, bearing dense spinules on entire surface of distal  $2/3$ , irregular rows of spines on distal  $3/5$ , and a large spine at distal end.

Female genitalia: Ductus bursae long, sclerotized and almost straight. Bursa copulatrix round, membranous and without signa. Cervix bursae coiled, and bulged distally. Distal end of ductus seminalis bulged. Papilla analis short.

Lectotype: ♂, Japan (BM noctuid genitalia slide no. 569), here designated.

Specimens examined: [HONSHU] 1♀, Ôtaki-mura, Kiso-gun, Nagano Pref., 18. viii. 1977 (H. HARA); 1♂1♀, Oigo, Onsen-chô, Mikata-gun, Hyôgo Pref., 10. viii. 1982 (Y. YOSHIDA & S. YOSHIMATSU); 3♂, Muraoka-chô, Mikata-gun, Hyôgo Pref., 8. viii. 1983 (S. YOSHIMATSU); 3♂, Kebioka, Muraoka-chô, Mikata-gun, Hyôgo Pref., 7. vi. 1984 (S. YOSHIMATSU); 1♀, Ryônan-danchi, near Mozu, Ôsaka Pref., 2. x. 1954 (M. GOTO); 1♂, same locality, 31. v. 1976 (M. GOTO); 1♂, same locality, 22. vii. 1976 (M. GOTO); 1♂. Mt. Shinnyû-san, Togauchi-chô, Yamagata-gun, Hiroshima Pref., 2. vi. 1983 (S. YOSHIMATSU, K. KONISHI & Y. YOSHIDA). [KYUSHU] 1♀, Shiibaru, Seburu, Fukuoka Pref., 21. v. 1975 (Y. YOSHIYASU et al.); 1♀, same locality, 4. viii. 1975 (K. UEDA & Y. YOSHIYASU); 1♀, Okinoshima Is., Fukuoka Pref., 24. vii. 1977 (K. SETOYA); 1♀, Terukuni, Fukuoka City, Fukuoka Pref., 11. x. 1981 (Y. NAKATA); 1♂, Hakomatsu, Fukuoka City, Fukuoka Pref., 18. v. 1982 (S. YOSHIMATSU); 1♂, Nokonoshima Is., Fukuoka Pref., 18. vi. 1983 (S. YOSHIMATSU, Y. NAKATA & I. SAGARA); 11♂, same locality, 12. ix. 1983 (S. YOSHIMATSU et al.); 2♀, Mt. Sangun-san, Fukuoka Pref., 6. x. 1984 (R. NODA & K. KONISHI); 1♂, Mt. Hiko, Fukuoka Pref., 4–5. xi. 1972 (K. UEDA & K. SETOYA); 4♂, same locality, 8. xi. 1977 (K. SETOYA et al.); 1♂, same locality, 21. xi. 1980 (S. YOSHIMATSU); 1♂, same locality, 9. xi. 1982 (N. KÔDA & K. KONISHI); 1♂, Mt. Tatera, Tsushima Is., Nagasaki Pref., 16–17. x. 1983 (K. KONISHI); 1♂, Mt. Aso, Kumamoto Pref., 18. vi. 1982 (collector unknown); 1♂, Cape Sata, Kagoshima Pref., 11. x. 1971 (K. UEDA, M. TAKAGI & Y. YOSHIYASU); 1♀, Mt. Takakumayama, Kagoshima Pref., 4. v. 1980 (H. OHTSUBO); Yunotani, Kirishima, Kagoshima Pref., 31. V. 1980 (H. OHTSUBO); 1♂, Miyanoura, Yaku Is., Kagoshima Pref., 16. vii. 1971 (collector unknown); 1♂, Ôkawa, Yaku Is., Kagoshima Pref., 21. iv. 1981 (S. YOSHIMATSU et al.); 1♂, Koshima, Yaku Is., Kagoshima Pref., 23. iv. 1981 (S. YOSHIMATSU et al.).

*Remarks.* In the male genitalia, the inner structure of the harpe of this species is similar to that of *insecuta*. The base of the ampulla of this species is situated in the mid-length of the valvula, while that of *insecuta* is situated at posterior  $1/3$  of the valvula. The vesica is largest among the three species dealt with here. This species is so far known only from Honshu and Kyushu including the Yaku Island, whereas *substriata* is distributed further south via Amami Island and the Ryukyu to Taiwan.

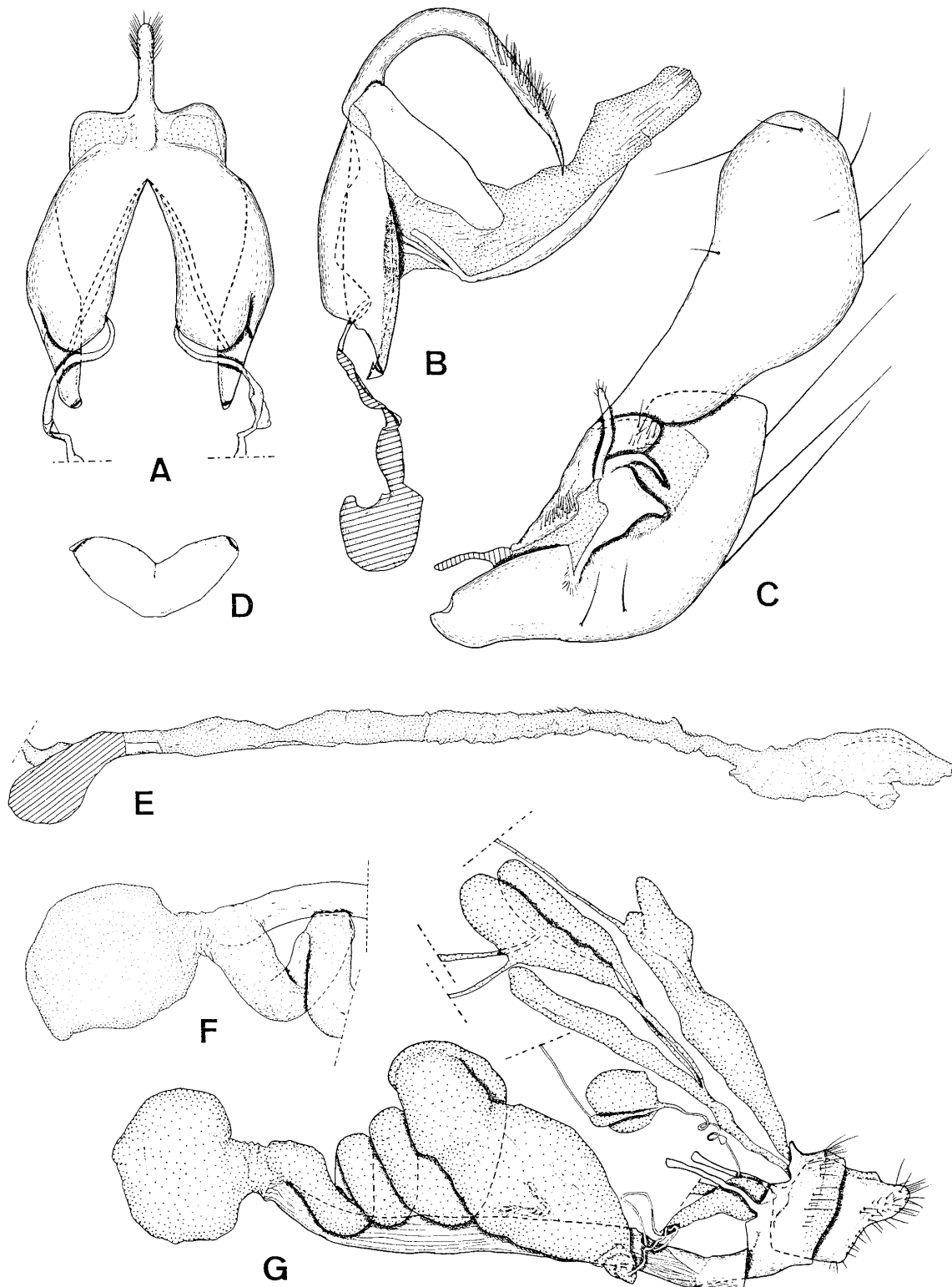


Fig. 4. Male and female genitalia of *L. striata* LEECH. A. Ring, frontal view ; B. *Ditto*, lateral view ; C. Right valva, inner view ; D. Juxta, dorsal view ; E. Phallus, with vesica everted, lateral view ; F. Bursa, dorsal view ; G. Female genitalia, lateral view.

***Leucania insecuta* WALKER**

(Figs. 5A – F)

*Leucania insecuta* WALKER, 1865, *List Specimens lepid. Insects Colln Br. Mus.*, **32**: 625.*Leucania intermissa* WALKER, 1865, *List Specimens lepid. Insects Colln Br. Mus.*, **32**: 626.*Neoborolia nohirae* MATSUMURA, 1926, *Insecta matsum.*, **1**: 59, pl. 1: 40.*Borolia griseola* MATSUMURA, 1926, *Insecta matsum.*, **1**: 60, pl. 1: 37.

Male external genital structure: Tegumen slender in lateral view, the dorsolateral portion being angulated in frontal view. Fenestrula narrow and almost sclerotized. Anellus with a weak sclerotized area dorsolaterally. Subligula short and wide. Vinculum short and curved posteriorly on dorsal portion. Saccus long and egg-shaped in lateral view. Uncus short and slightly curved, with many short hairs. Valva long; transtilla elongated anterodorsally; costa long and slightly curved dorsally; editum large and rounded; ampulla short and slightly curved ventrally; sacculus wider and bearing a small hairy process posterodorsally; dorsal process of harpe slender, posterodistal corner of harpe projected ventrally and reached to posterior 1/3 of valvula; valvula with long spines; cucullus not so bulged ventrally as former two species and with marginal spines. Juxta almost U-shaped. Vesica 7.0 mm-7.5 mm when it is everted and 2.4 times as long as aedeagus, with dense spinules on entire surface of distal 1/2 of vesica, with two patches of spines on distal 1/2 of vesica, and with a large spine on distal end.

Female genitalia: Ductus bursae long and sclerotized. Bursa copulatrix round, membranous and without signa. Cervix bursae sclerotized basally and membranous on distal half. Distal end of ductus seminalis bulged. Papilla analis long.

Specimens examined: [HOKKAIDO] 1♂, Ashorobuto, Ashoro-chô, Ashoro-gun, 21. vii. 1983 (I. SAGARA); 1♀, same locality, 30. vii. 1983 (I. SAGARA). [HONSHU] 1♂, Nanokamachi, Niitsu City, Niigata Pref., 26. v. 1962 (S. SAKURAI).

*Remarks.* This species superficially resembles *substriata* and *striata*, but it is distinguished from the latter by the following characters. The postmedial line of the forewing is usually represented by a single series of black points, while it appears as double series of black points in *substriata* and *striata*. In the male genitalia the saccus is the largest and egg-shaped in this species. The uncus is the shortest among the three species and more weakly curved in lateral view than in *substriata* and *striata*. The dorsolateral portion of the tegumen is rectangular in this species, while these portions are weakly curved in *substriata* and *striata*. The vesica is the shortest in this species. Among the three species, only this species has brush organs on the ventral surface of the abdomen 1+2 in the male. In the female genitalia the cervix bursae is nearly straight in this species, but it is coiled in the others.

Distribution: China; Japan (Hokkaido, Honshu).



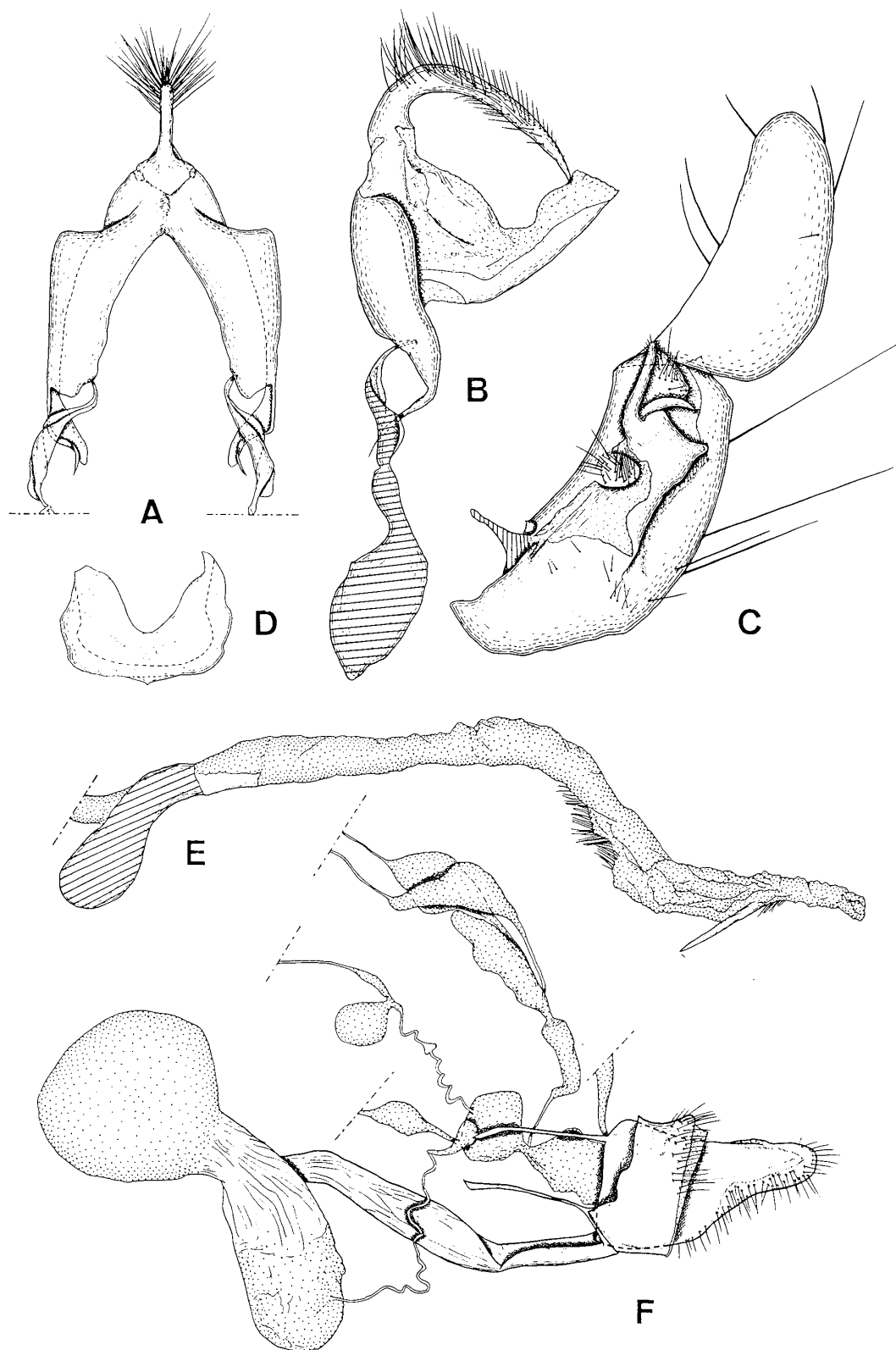


Fig. 5. Male and female genitalia of *L. insecuta* WALKER. A. Ring, frontal view ; B. *Ditto*, lateral view ; C. Right valva, inner view ; D. Juxta, dorsal view ; E. Phallus, with vesica everted, lateral view ; F. Female genitalia, lateral view.

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### References

- BIRCH, M. C., 1972. Male abdominal brush-organs in British noctuid moths and their value as a taxonomic character. Part I, II, *Entomol.*, **105**: 185–205, 233–244.
- HAMPSON, G. F., 1905. *Cirphis insecuta*. *Catalogue of the Lepidoptera Phalaenae in the British Museum.*, **5**: 534–535, pl. 93. London.
- KUZNETSOV, N. Ya., 1967. *Fauna of Russia and Adjacent Countries.*, vol. 1., Introduction. 305 pp. Jerusalem. (English translation of Kuznetsov, 1929).
- LEECH, J. H., 1900. *Leucania striata*. Lepidoptera Heterocera from Northern China, Japan, and Korea. *Trans. ent. Soc. London.*, **1900**: 127.
- NAITO, A., 1980. Insect pests of forage crops (*Leucania separata* WALKER). Diagnosis and control of insect pests and plant disease 8. Insect pests of forage crops. 1–6., Nonsangyoson-bunkakyokai, Tokyo. (In Japanese.)
- SHIBATANI, A., M. OGATA, Y. OKADA & H. OKAGAKI, 1954. Male genitalia of Lepidoptera: Morphology and Nomenclature. I. Divisions of The Valvae in Rhopalocera, Phalaenidae (= Noctuidae) and Geometridae., *Ann. Ent. Soc. Amer.*, **47**: 93–106.
- SHIRÔZU, T., 1960. *Butterflies of Formosa in color*. 481 pp., Hoikusha, Osaka.
- SUGI, S., 1962. *Leucania insecuta* WALKER and *L. striata* LEECH, two distinct species (Lepidoptera, Noctuidae, Hadeninae). *Kontyû, Tokyo*, **30**: 116–119, 6 pls.
- 1982. *Leucania insecuta* WALKER & *L. striata* LEECH. In Inoue, H. et al., *Moths of Japan*, **1**: 719, **2**: 358–359, pls. 177, 362.

### 摘 要

*Leucania striata* LEECH (スジシロキヨトウ) と 1 新種を含む近縁種の分類学的研究  
(吉松慎一)

*Leucania striata* は LEECH (1900) により, 日本 (Japan) と琉球 (Loochoo) の 16 個体に基づいて

記載された。ところが、いわゆる *L. striata* とされてきたものには、実は2種が混同されていることが判明した。これら2種は、外見的には全く差異がなく、雌雄交尾器によってしか区別できない。筆者は手元にある100個体余りの標本を解剖し、1種は屋久島を南限とし九州から本州にかけて分布するのに対し、他の1種は台湾を南限とした分布をしていることを明らかにした。

この2種の雌雄交尾器の図を大英博物館の HOLLOWAY 博士の元へ送ったところ、大英博物館には“Japan”とラベルされた *L. striata* 7個体が存在し、そのうち“type”とラベルされた雌雄各1個体が解剖されており、この雌雄2個体とも筆者の送ったうちの1種と合致することが判明した。そこで大英博物館所蔵の解剖された1♂を *L. striata* の lectotype として指定した (BM noctuid genitalia slide no. 569)。そして、台湾、九州、四国、本州で採集された他の1種を新種 *Leucania substriata* YOSHIMATSU ニセスジシロキョトウ (新称) として記載した。

また *L. insecuta* WALKER は以上の2種に類似しているので、併せてこれら3種の形態的差異と分布を述べた。

1. 分布: *insecuta* は本州、北海道、国外では中国に分布し、*striata* は屋久島を南限として九州、本州で採集されており、*substriata* は台湾、沖縄、奄美大島、屋久島、九州、四国、本州の一部で採集されている。

2. 翅: 前翅外横線は *insecuta* では通常1列の黒点列なのに対し *substriata* と *striata* では通常2列の黒点列で表される。

3. 雄交尾器: Tegumen 背側方部は前方より見ると *insecuta* ではほぼ直角をなす。Saccus は側方より見ると *insecuta* では卵形。Harpe は *substriata* では最も大きく、harpe 基部は *insecuta* でよく発達する。Vesica は *striata*, *substriata*, *insecuta* の順に長い。

4. 雌交尾器: Cervix bursae は *insecuta* ではほぼまっすぐなのに対し、他の2種では巻いている。Cervix bursae の基部は *substriata* では幅広く、ductus bursae の左側方に付着するのに対し、*striata* では cervix bursae の基部は ductus bursae の左背側方に付着する。